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#8
Garla 12/19/02

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Group:	1762
Confirmation No.:	9358
Application No.:	09/742,625
Invention:	**In-Press Process For Coating Composite Substrates**
Applicant:	Frank Bor-Her Chen, et al.
Filed:	December 20, 2000
Attorney Docket:	25164-67462
Examiner:	Rebecca A. Blanton

Certificate Under 37 CFR 1.8(a)

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on December 12, 2002

Garla L. Twyman
(Signature)

Garla L. Twyman
(Printed Name)

RESPONSE UNDER 37 C.F.R. § 1.111

BOX NO FEE RESPONSE
Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

This is in response to the Official Action mailed September 12, 2002, for the captioned application. The claims in the application are claims 37-48. Claims 37-39, 41-46 and 48 stand rejected. Claims 40 and 47 are objected to as depending from a rejected claim.

The rejected claims are directed to a process of manufacture of polymer coated substrates. The process comprises the steps of forming a chemically crosslinked polymer coating on a compressible mat without heating and thereafter compressing and heating the crosslinked coating and the mat to form the polymer coated composite substrate. In one embodiment the polymer coating is formulated to become ionically crosslinked as the coating mixture is applied before heating and compression of the compressible mat. The formation of a crosslinked coating prior to the application of heat/compression works to prevent the coating mixture from being drawn, under the influence of capillary action and the applied

pressure, into the porous substrate during the subsequent heating/compression step. It thus provides for the production of coated composite substrates having more uniform, aesthetically pleasing coatings directly out of the press. Accordingly, it is an important aspect of the presently claimed invention that the polymer coating applied to the mat is chemically crosslinked either by ionic or covalent bonds prior to the step of compressing and heating the crosslinked coating and the mat to form a polymer coated composite substrate.

Claims 37, 41,44 and 48 are rejected under 35 U.S.C. §102(b) as being anticipated by the newly cited Matejka et al., U.S. Patent No. 4,517,228 (Matejka '228). The Matejka '228 reference describes and claims a process for forming coated composition boards by addressing some of the same problems targeted by Applicants' claimed invention. Notably the problem associated with coating absorption into the porous substrate during the heating and compression step is addressed by both the present invention and that described by the Matejka '228 patent. However, a review of the Matejka '228 reference reveals that the "coating hold-out" is achieved by a totally different approach than that underlying the presently claimed invention. The Matejka '228 process utilizes a composition containing a platelet form of talc that tends to plug the pores/capillary openings in the porous substrates during the compression step and thereby does not allow the polymer composition to be drawn or absorbed into the board during the heating compression step. The Matejka '228 reference points specifically to the hold out problem at column 2, line 61-column 3, line 2:

> Another problem with prior art products was the lack of density or surface hardness of the hardboard. These deficiencies caused paint hold-out problems and poor exterior durability of the product. For example, in coating many prior art hardboards, the coating composition would be extensively adsorbed into the hardboard itself and as a result, large amounts of expensive coating compositions were required.

The talc component works effectively to plug the pores in the compressible substrate to prevent the polymer composition from being drawn into the compressible matrix as the matrix is being heated and compressed. Matejka '228 teaches at column 4, lines 3 *et seq.* that:

> In either event, it is crucial that the talc composition of the instant invention be of the platelet form. In other words, the material must form platelets which are wider and broader than

they are thick. In general, it is preferred that the talc compositions of the instant invention have aspect ratios (average diameters/average thickness) of about 10:1 to 30:1, preferably about 15:1 to about 25:1, and that they have diameters of about 1-4 μm and thicknesses of about 0.5 to about 0.05 μm, preferably diameters of about 2 μm and thicknesses of about 0.1 μm.

The Examiner points out that Matejka et al. discloses a process for coating a fiber mat with a "crosslinkable coating" prior to heat and pressure treatment, to form a cross-linked coating that provides superior surface finishes on composition board products. Applicants' claimed invention, in contrast, requires the step of forming a chemically cross-linked polymer (as opposed to "crosslinkable" polymer coating) on a compressible mat without heating and thereafter compressing and heating the crosslinked coating and the mat to form the polymer coated composite substrates.

In one aspect of the present invention, the coating formulation is selected so that it forms an ionically crosslinked polymer coating on the surface as it is applied to the compressible mat. With the coating composition already crosslinked prior to application of heat and compression to the mat, the coating composition is not drawn into the pores of the mat during the heating/compression step. It is clear from reading the cited Matejka '228 reference that "hold-out" functionality is not achieved by forming a preheat/compression step crosslinked coating, but instead by using an additive, platelet talc, which works to plus the pores in the porous substrate and prevent the heated and compressed coating from being drawn into the porous substrate during the compressing and heating step.

Thus, while the cited Matejka '228 reference does teach methodology and compositions for addressing one of the same problems addressed by the present invention, it is clear that the composition and process of the cited patent is readily distinguished from the subject matter of the present invention. It is particularly clear, too, that the cited Matejka '228 reference does not describe the claimed embodiments of Applicants' invention requiring the steps of forming an ionically crosslinked polymer coating on a compressible mat and thereafter compressing and heating the crosslinked coating and the mat to form the polymer coated composite substrate. Applicants respectfully contend that the Matejka '228 patent cannot fairly be said to anticipate or even suggest Applicants' claimed invention which requires the formation of a crosslinked coating on the compressible mat prior to the heating and compressing steps. The rejection of the claims under §102 over the cited Matejka '228

reference is believed to be improper. Reconsideration of that rejection leading to its withdrawal is respectfully requested.

Claims 38-39 and 45-46 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Matejka '228 as applied to the above-discussed claims in view of Mirous et al. U.S. Patent No. 5,719,239 (Mirous '239). Mirous '239 teaches a process for forming a coated cellulosic panel wherein the coating is formulated to exhibit flexible thermoplastic properties upon reheating to allow for embossing operations with little or no embossing plate buildup. The critical topspray coating composition described by Mirous '239 contains both a thermoset resin and a thermoplastic resin in quantities sufficient to exhibit a softening temperature within a range of about 130 to about 300°C. "The curing temperature is preferably above the melting point of the thermoplastic polymer to effect bonding. Preferred temperatures are in excess of 130°C, and preferably between the range of about 150°C to about 200°C." [Column 9, lines 31-34, and 58-61].

As earlier acknowledged by the Examiner, the Mirous reference does not teach that the topcoat composition is chemically crosslinked without heating before heating and compressing the compressible mat. Indeed, the topcoat composition is formulated to cure at temperatures in excess of 130° and preferably within the range of about 150° to about 200°C. Respectfully, it seems clear that the Mirous et al. '239 reference does not teach a coating composition that is crosslinked on the surface of a porous compressible mat without heating. The deficiencies in the teaching of the primary Matejka '228 reference with respect to claims 27, 41-44 and 48 have been discussed in detail above, and while Applicants acknowledge the Examiner's point that the Mirous et al. reference teaches that wooden construction panels often comprise a layer of paper between the panel and the topcoat to obtain certain visual properties, such teaching cannot fairly be said to bridge the gap, so to speak, between the deficient teaching of the primary Matejka '228 reference and the subject matter of the rejected claims. The differences between the subject matter claimed and the prior art are such that the claimed invention, as a whole, would not have been obvious to one of ordinary skill in the art at the time the invention was made. Reconsideration of the rejection of claims 39-39 and 45-46 for obviousness over the Matejka '228 in view of Mirous '239 leading to withdrawal of that rejection and passage of the application to issuance is requested.

Applicant acknowledges with appreciation the Examiner's finding that claims 40 and 47 would be allowable if rewritten in independent form, including all of the limitations of the base claim and any intervening claims. Those claims were not amended in this paper for the reason that the rejections over the cited references are believed to be

improper. Reconsideration of the claims leading to withdrawal of those rejections and passage of the application to allowance is respectfully requested.

Respectfully submitted

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